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March 10, 2003

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By: Nancy Foster

PATENT

Customer Number 22,852

Attorney Docket No. 4121.0116-01000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Holly H. HOGREFE et al.

Serial No.: 08/957,709

Filed: October 24, 1997

For: POLYMERASE ENHANCING
FACTOR (PEF) EXTRACTS, PEF
PROTEIN COMPLEXES, ISOLATED
PEF PROTEIN, AND METHODS
FOR PURIFYING AND
IDENTIFYING THEM

Group Art Unit: 1652

Examiner: D. Ramirez

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293
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ATTN: OFFICIAL DRAFTSPERSON
Commissioner for Patents
Washington, DC 20231
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SUBMISSION OF SUBSTITUTE DRAWINGS

Subject to the approval of the Examiner, please replace the originally filed drawings with the forty-four (44) sheets of substitute drawings filed herewith (Figures 1 through 44). If the corrected drawings for any reason are not in full compliance with the pertinent statutes and regulations, please so advise the undersigned.

If any fees are necessary for the submission of these corrected drawings, please charge our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: March 10, 2003

By: Robert W. Mann
Robert W. Mann
Reg. No. 48,555

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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
Filed: October 24, 1997
Attorney Docket No.: 04121.0116-01000
Page 1 of 44

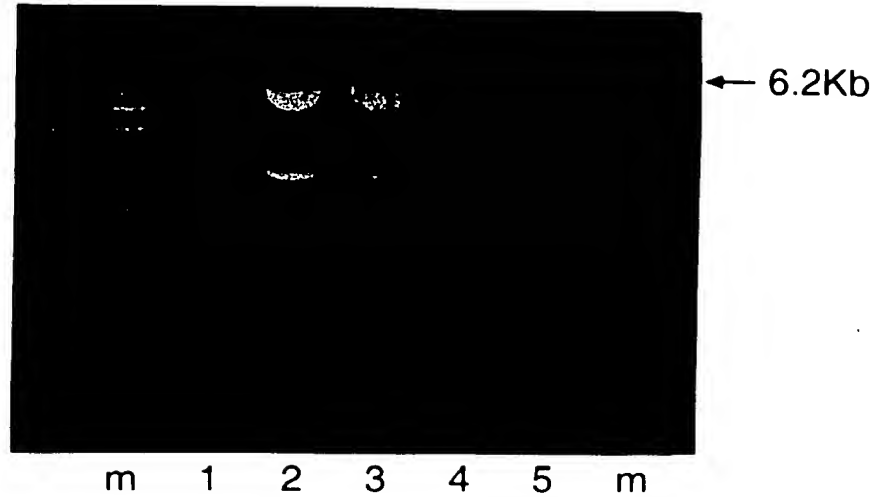


FIG. 1

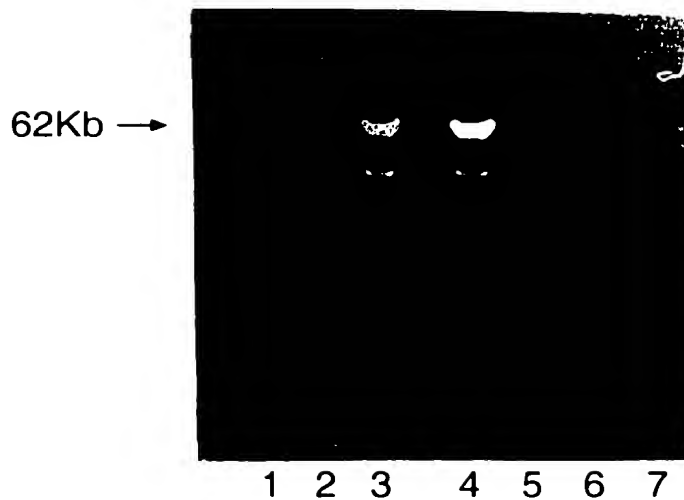
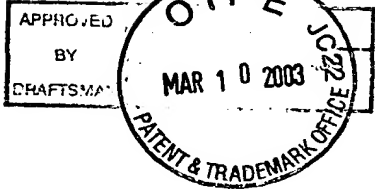


FIG. 2



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS,
PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND
METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
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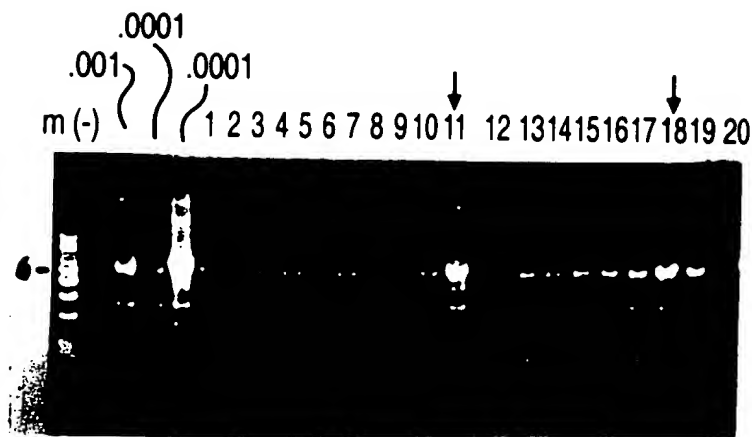
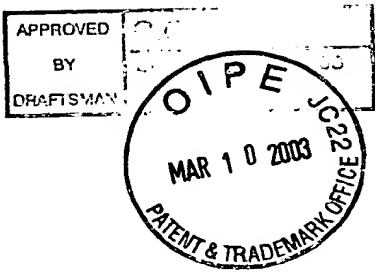


FIG. 3



FIG. 7



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
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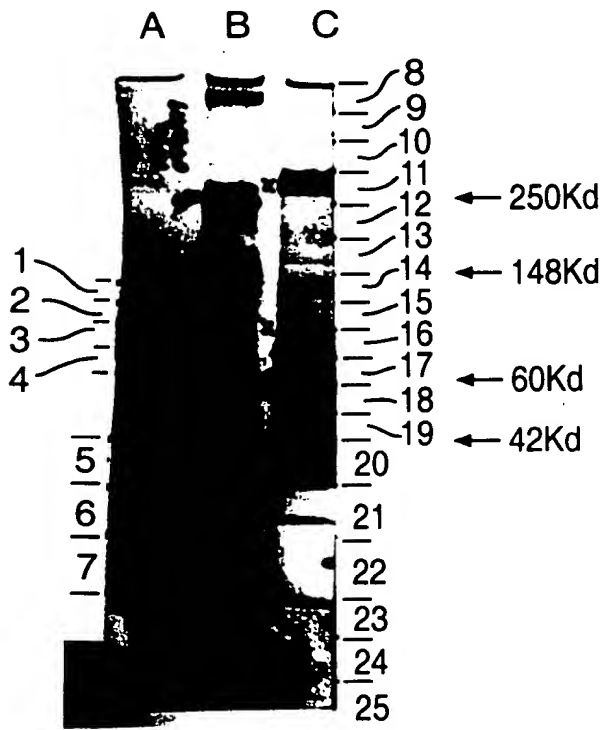
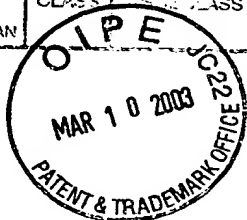


FIG. 4

APPROVED	O.G. FIG.
BY	CLASS & SUBCLASS
DRAFTSMAN	



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
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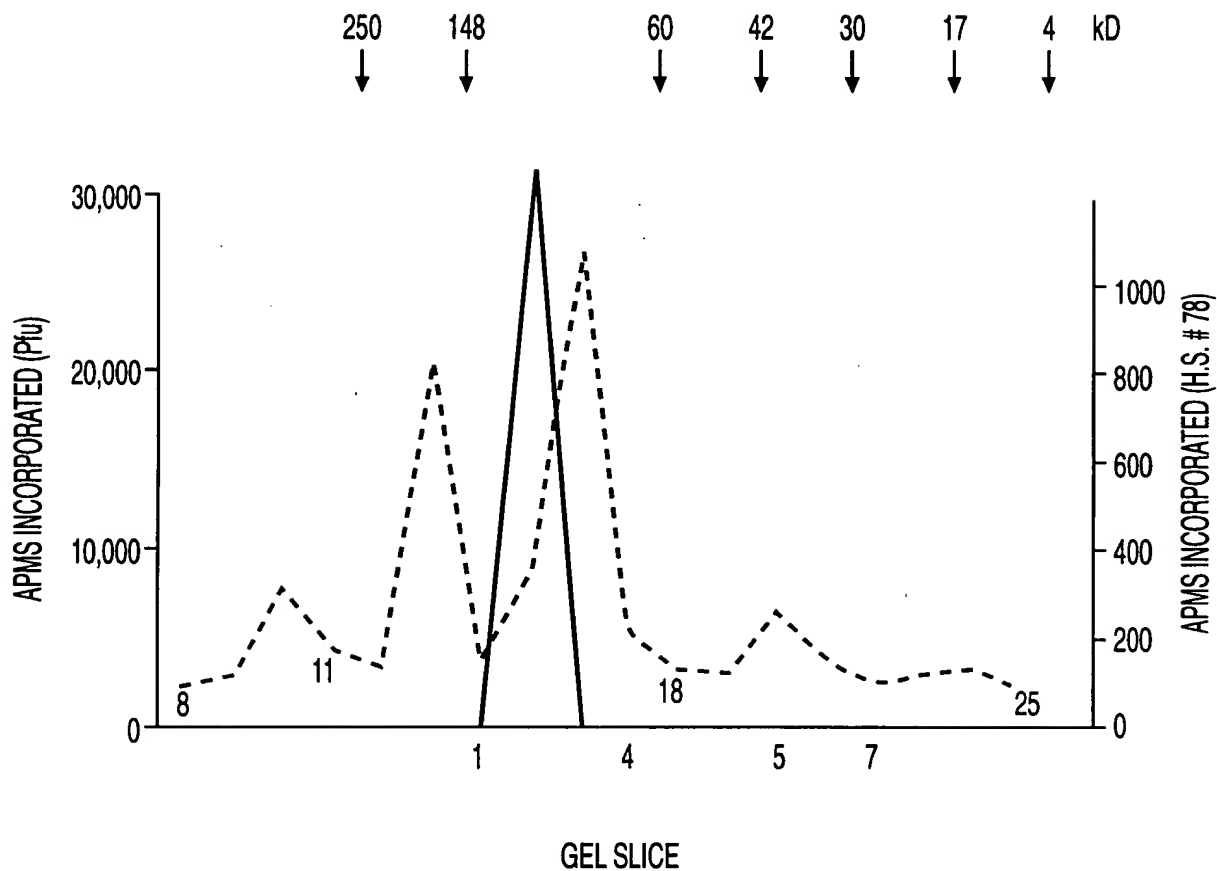


FIG. 5

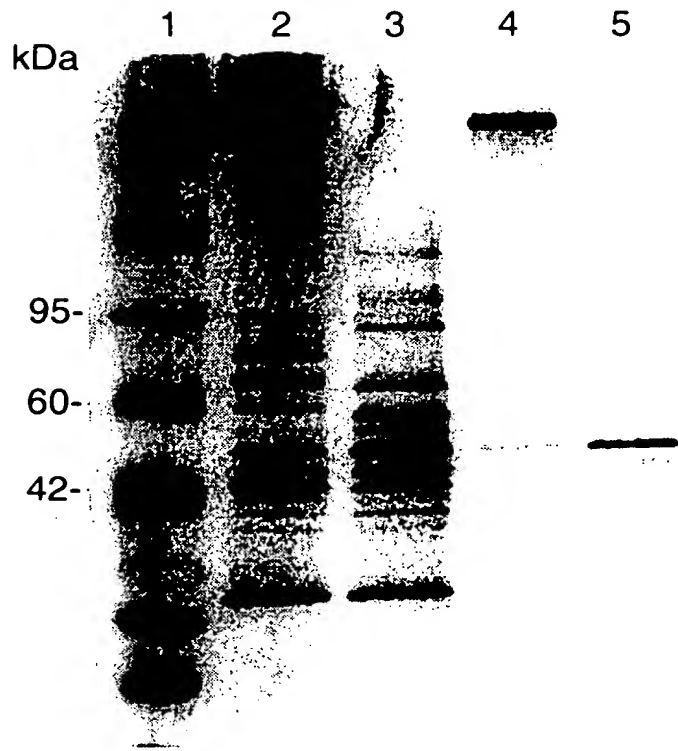
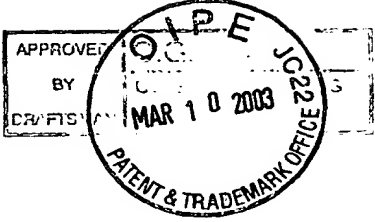
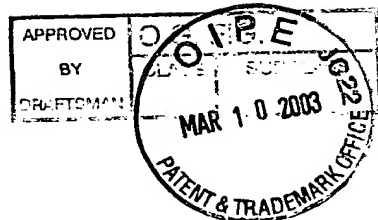


FIG. 6



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
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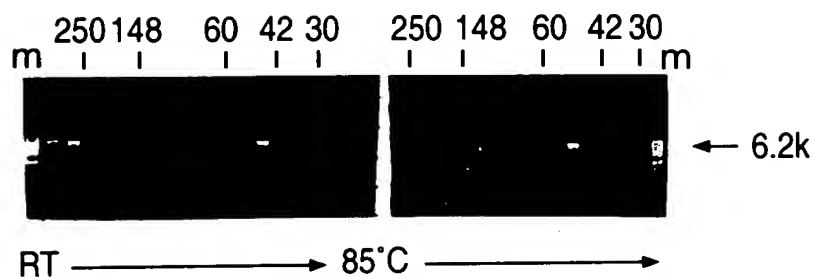


FIG. 8

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O.G. F. CLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING
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Attorney Docket No.: 04121.0116-01000
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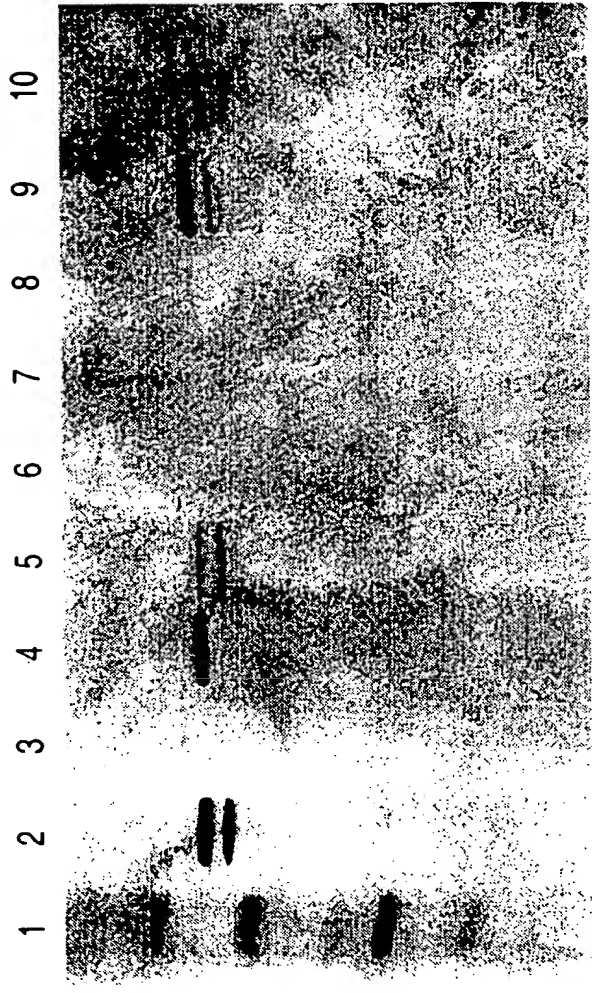


FIG. 9

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BY	CLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
 Application No.: 08/957,709
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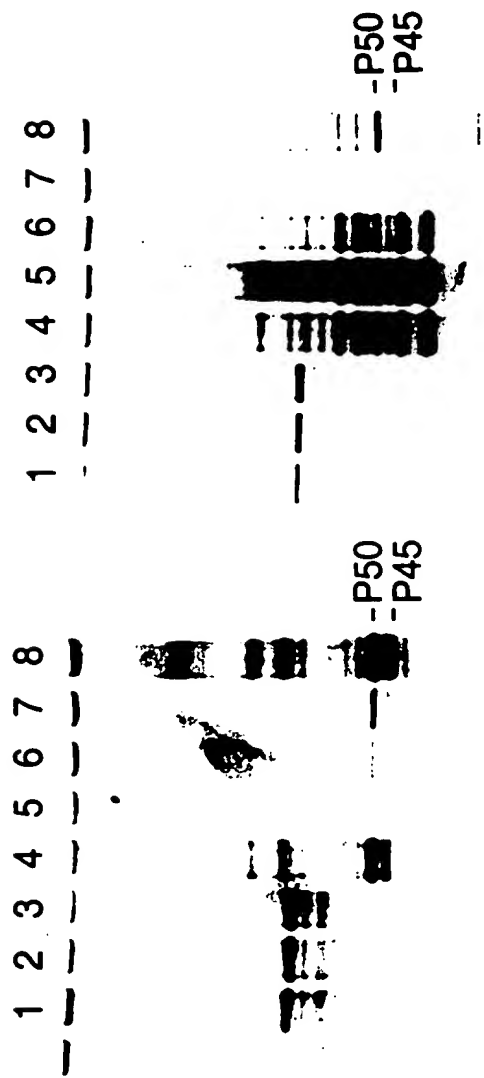


FIG. 10



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
Filed: October 24, 1997
Attorney Docket No.: 04121.0116-01000
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FIG. 11A

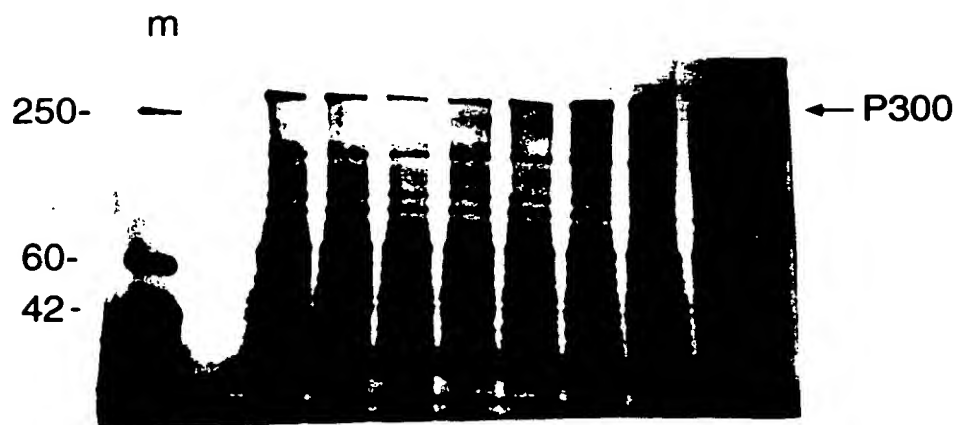


FIG. 11B

APPROVED	J.G. FIG.	
BY	PLSSE	SUBCLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
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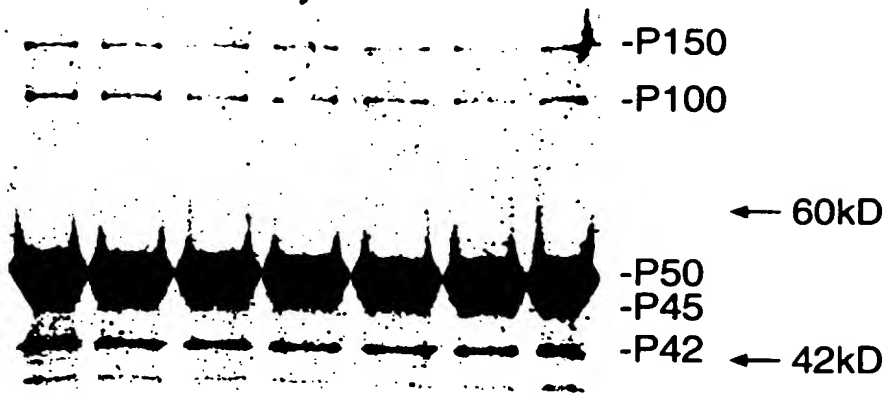


FIG. 12

APPROVED BY O.G.F. 301 P.E. SUBCLASS MAR 10 2003 PATENT & TRADEMARK OFFICE

Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING S
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
Filed: October 24, 1997
Attorney Docket No.: 04121.0116-01000
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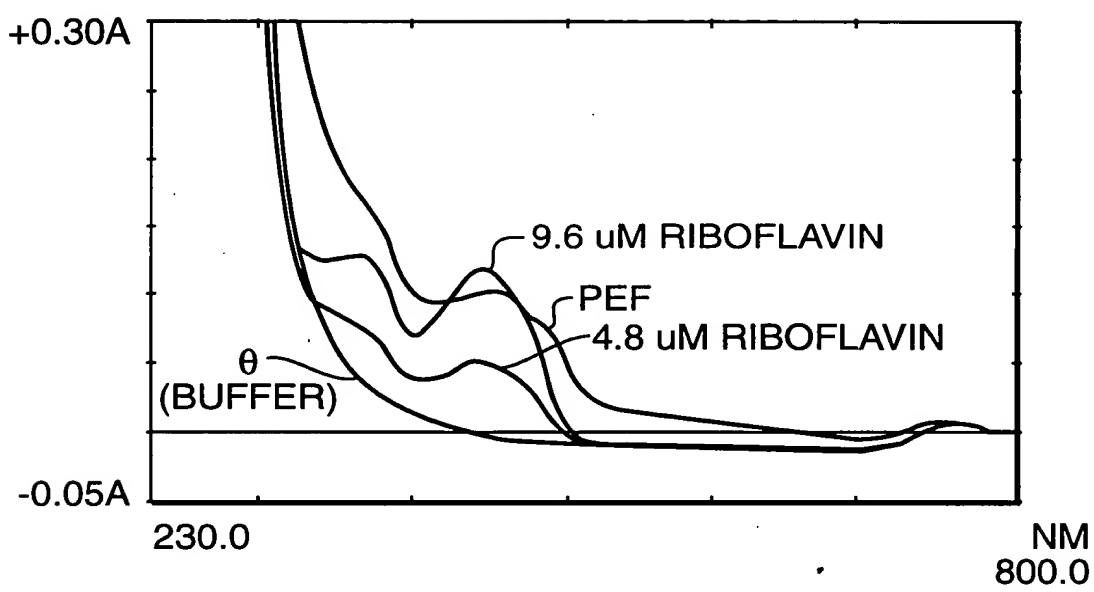
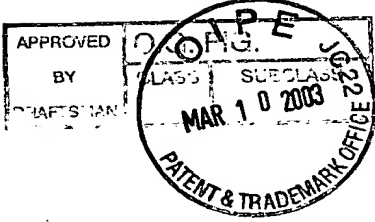


FIG. 13



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
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			CLONE 1			CLONE 23				
			PEF LOT 49							
PEF LOT 52	NONE	7	0.7	0.2	7	0.7	0.2	1 ul (1/10)	1 ul (1/10)	5 ul

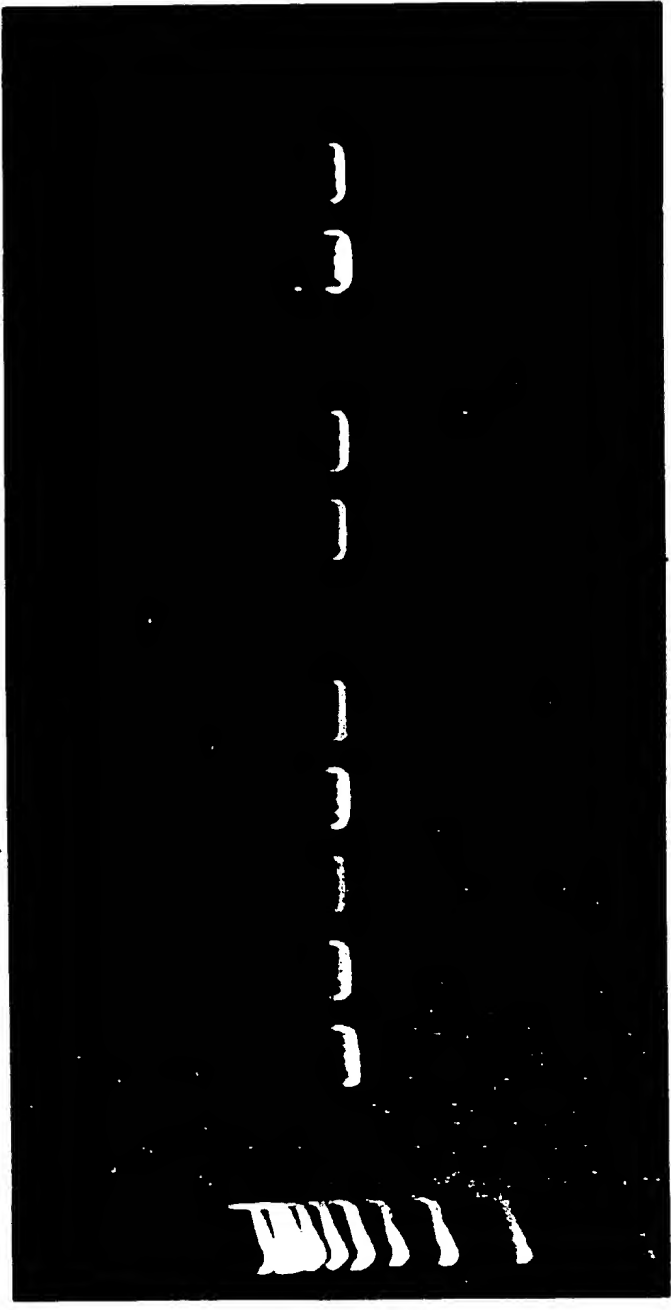
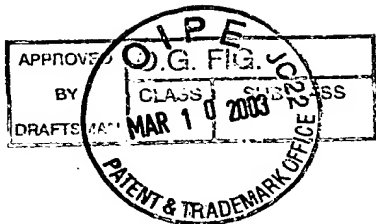


FIG. 14



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
Filed: October 24, 1997
Attorney Docket No.: 04121.0116-01000
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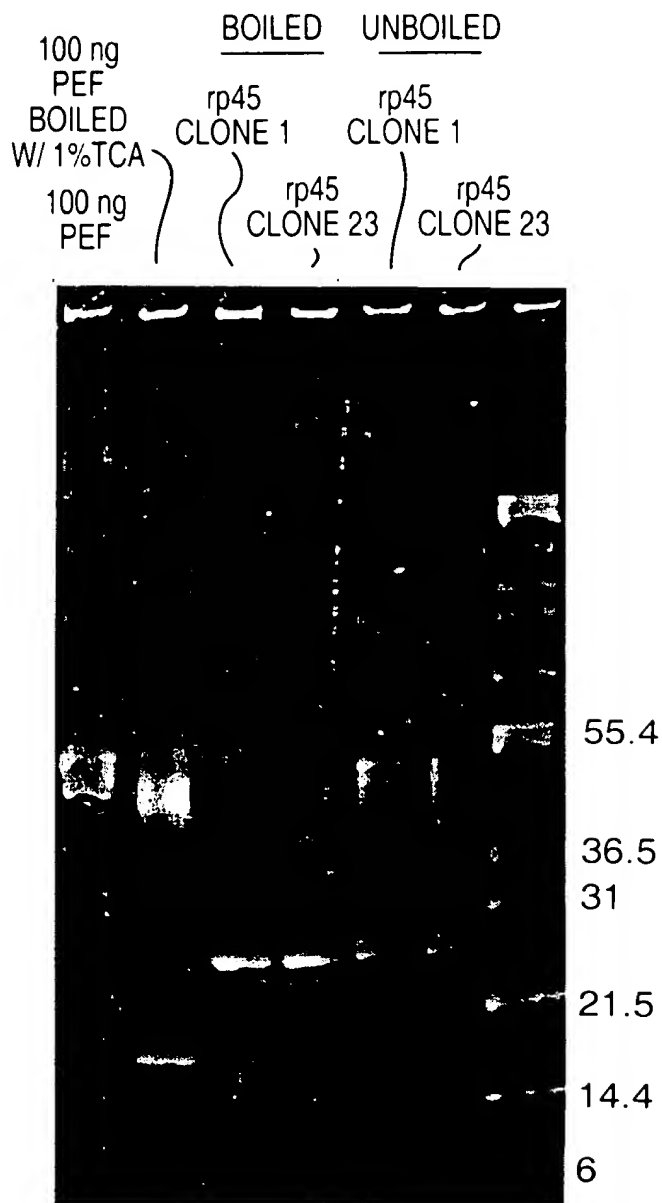
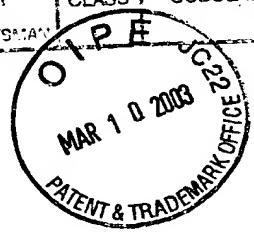


FIG. 15

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
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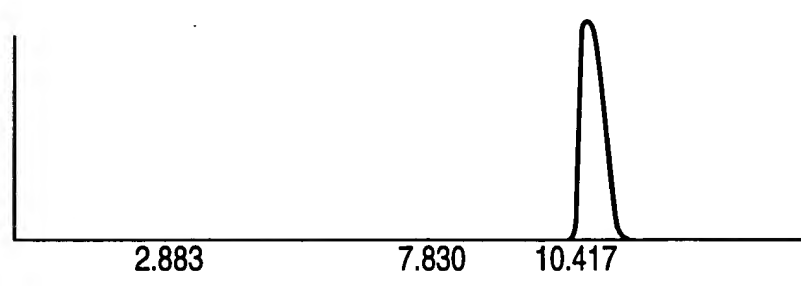


FIG. 16A

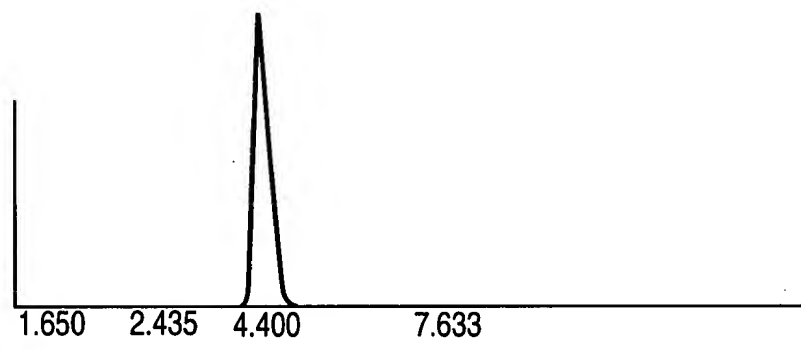


FIG. 16B

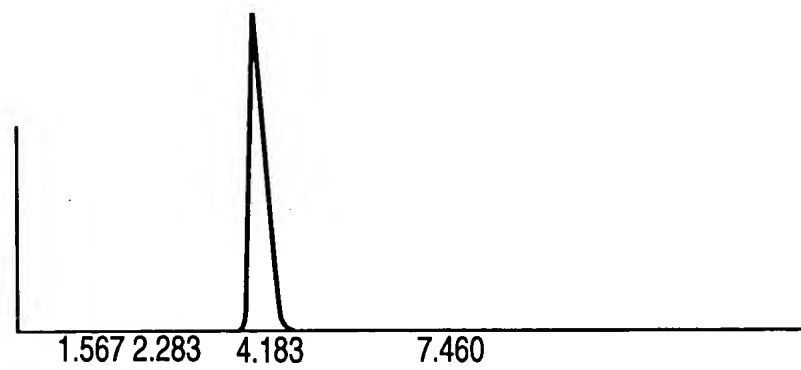


FIG. 16C

APPROVED	D.G. FIG.	
BY	CLASS	SUBCLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS,
 PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND
 METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
 Application No.: 08/957,709
 Filed: October 24, 1997
 Attorney Docket No.: 04121.0116-01000
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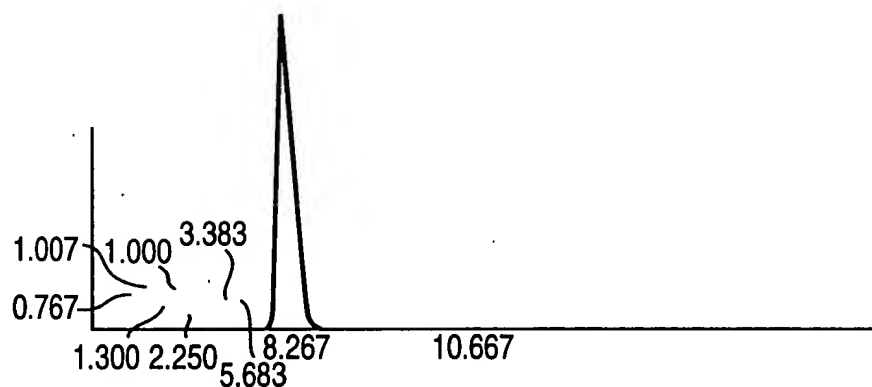


FIG. 16D

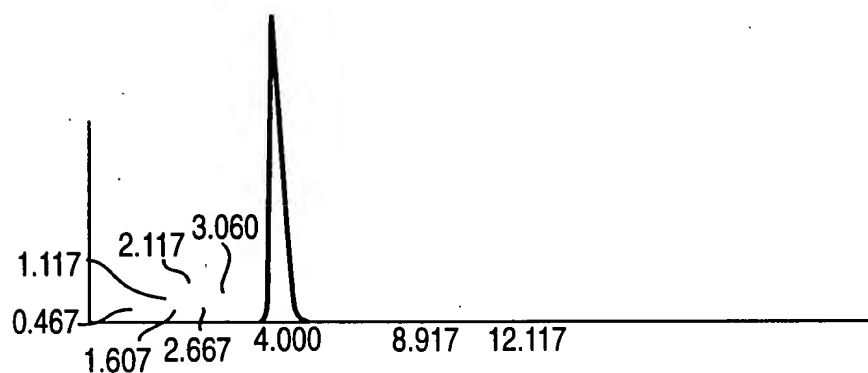


FIG. 16E

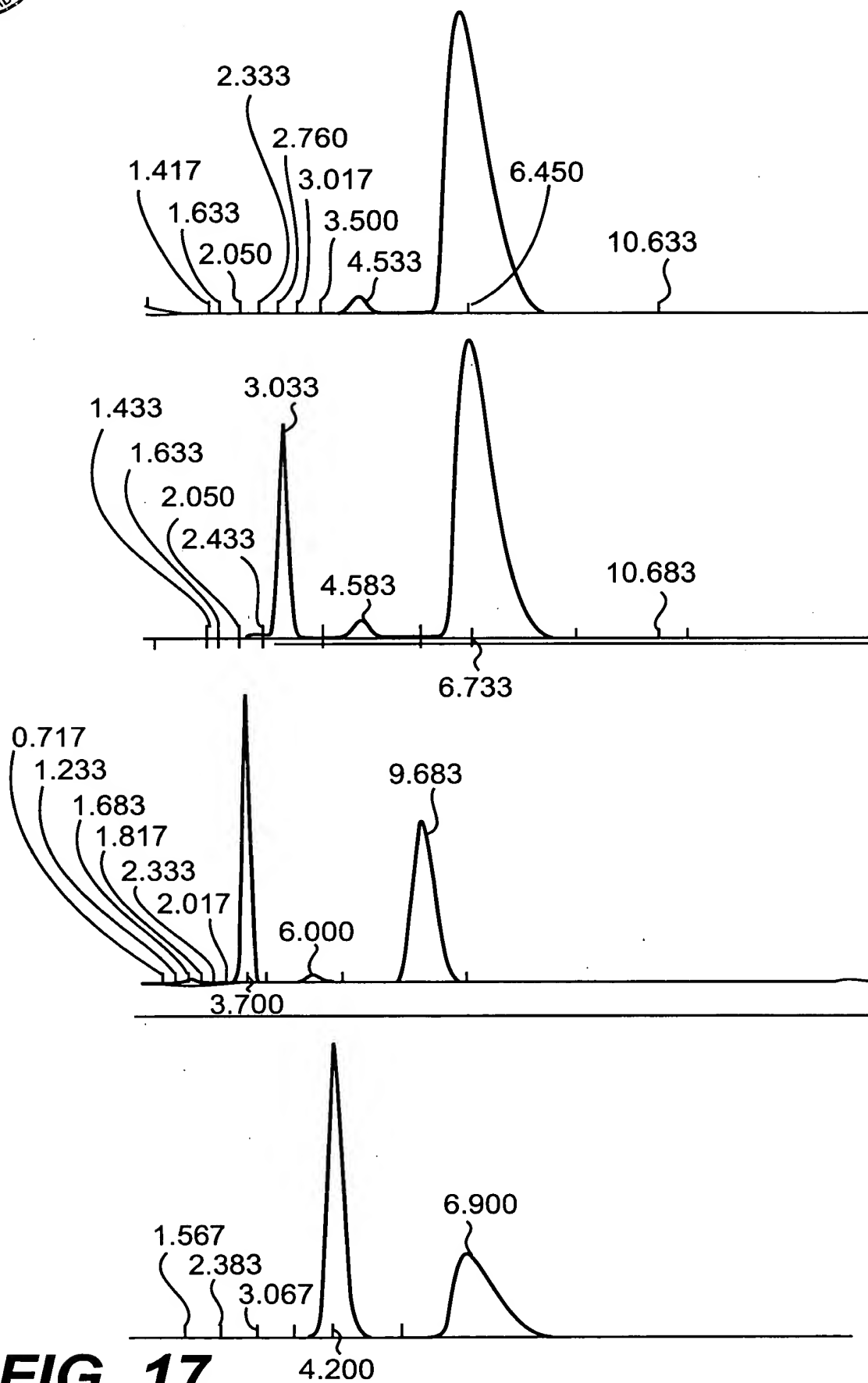
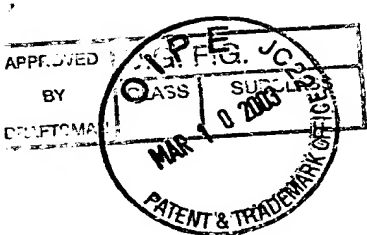
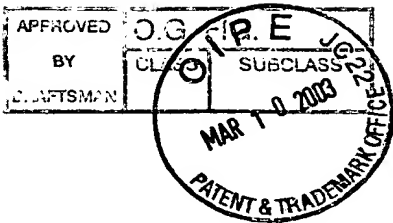


FIG. 17



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
Filed: October 24, 1997
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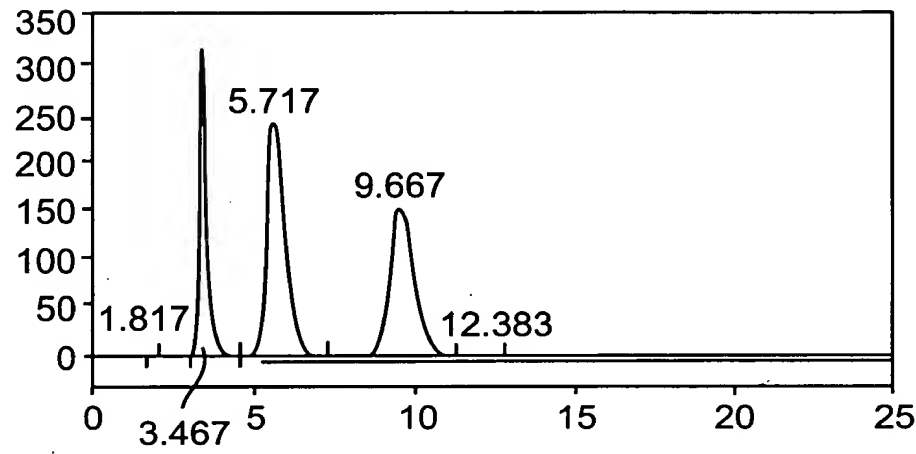


FIG. 18C

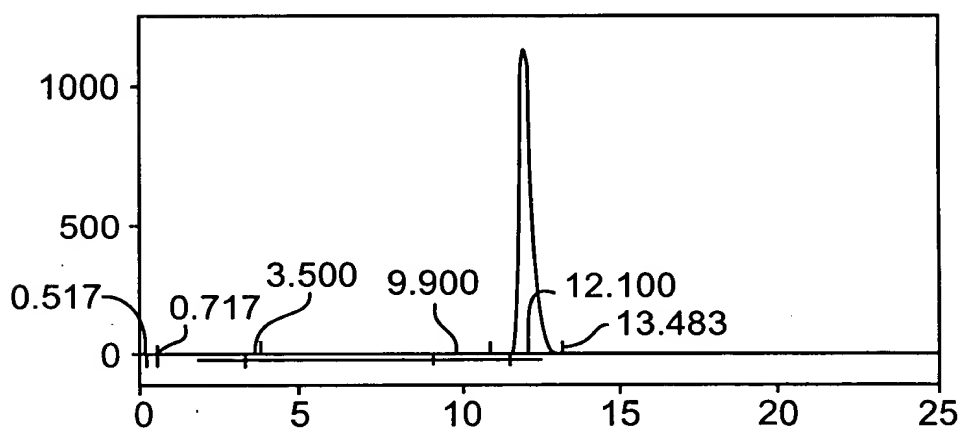


FIG. 18D

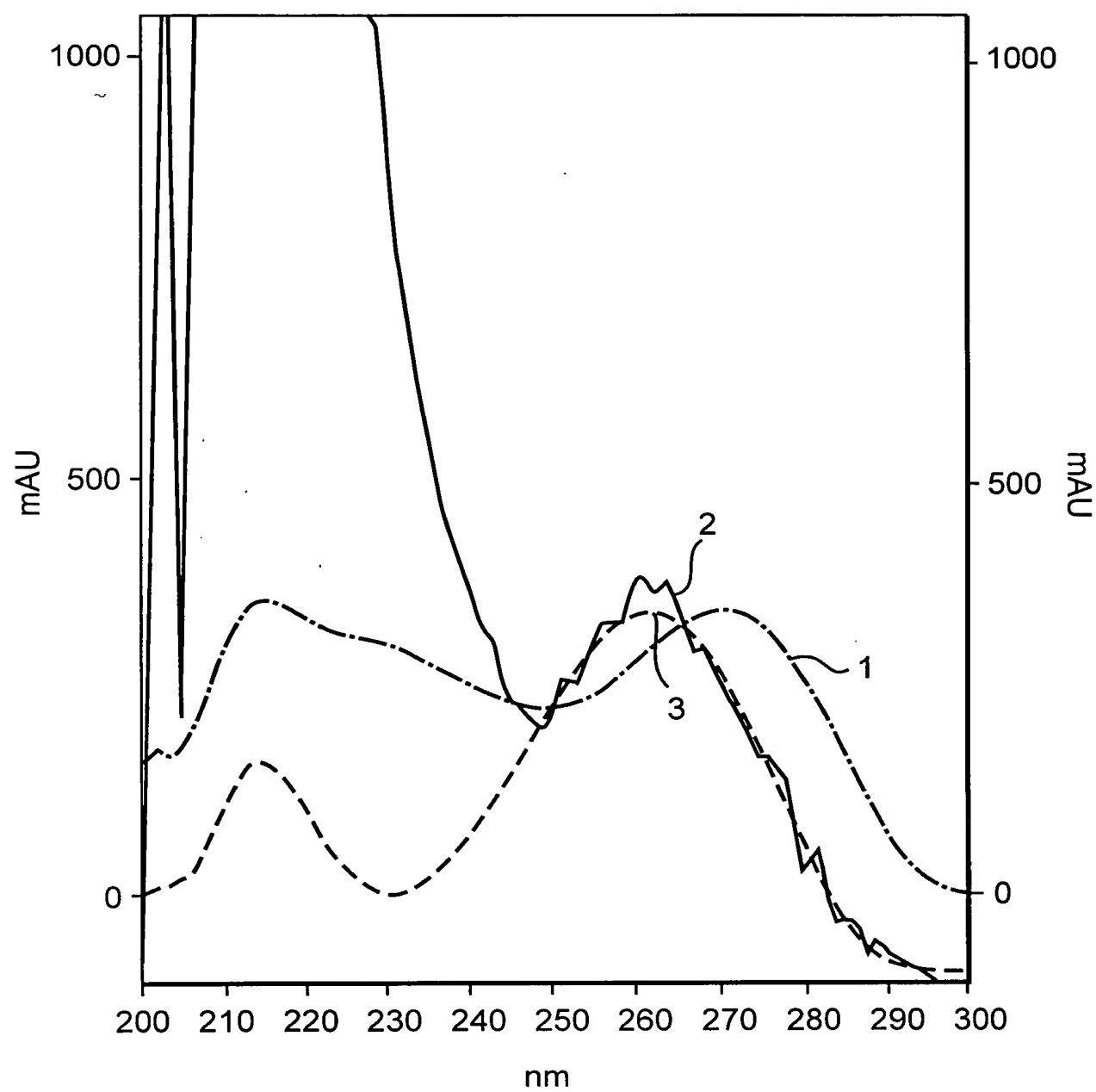
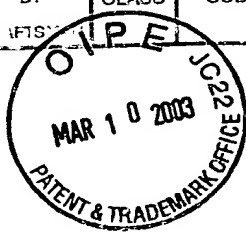
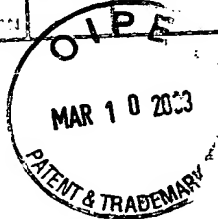


FIG. 19

APPROVED	D.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
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 Attorney Docket No.: 04121.0116-01000
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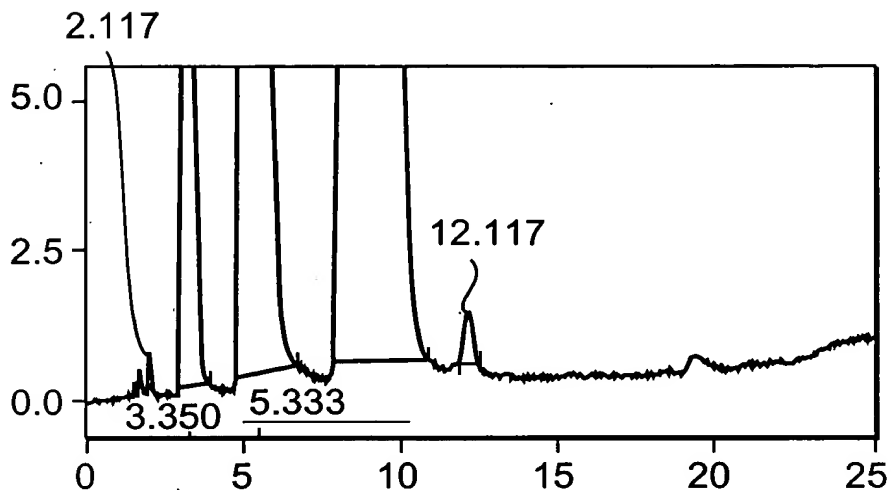


FIG. 20A

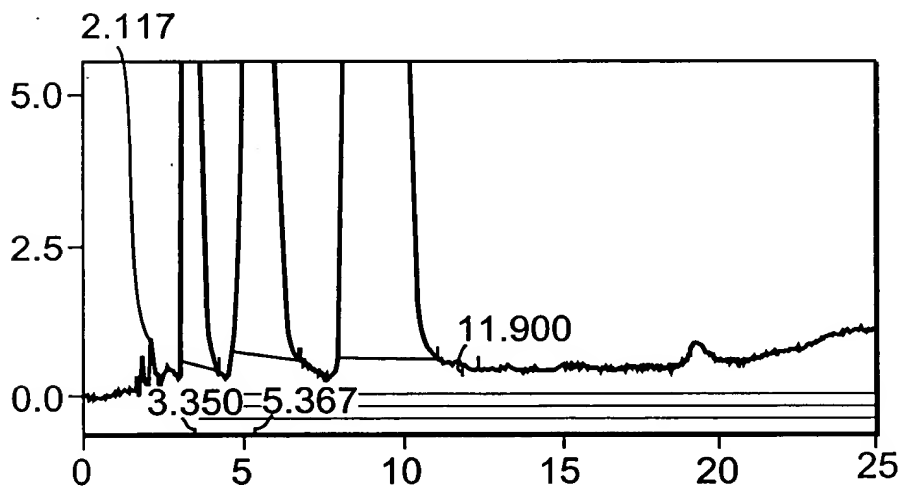


FIG. 20B

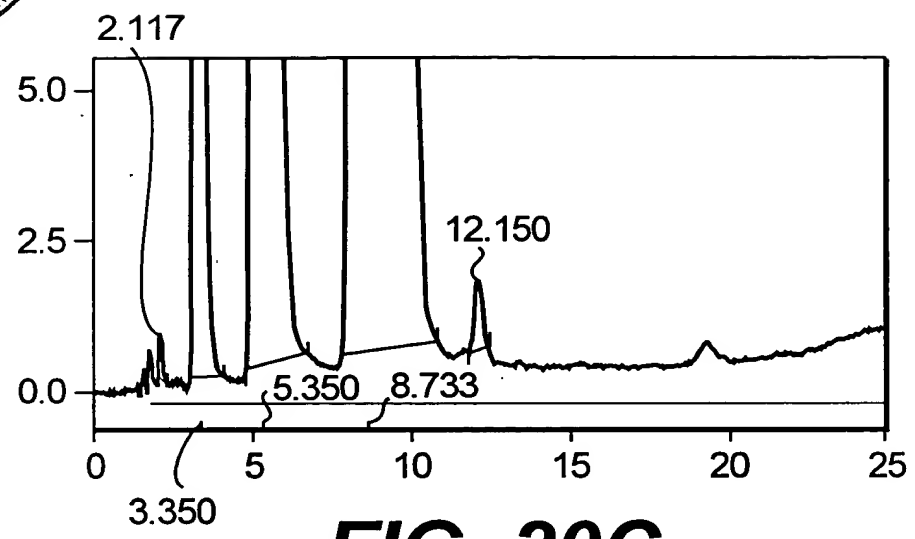


FIG. 20C

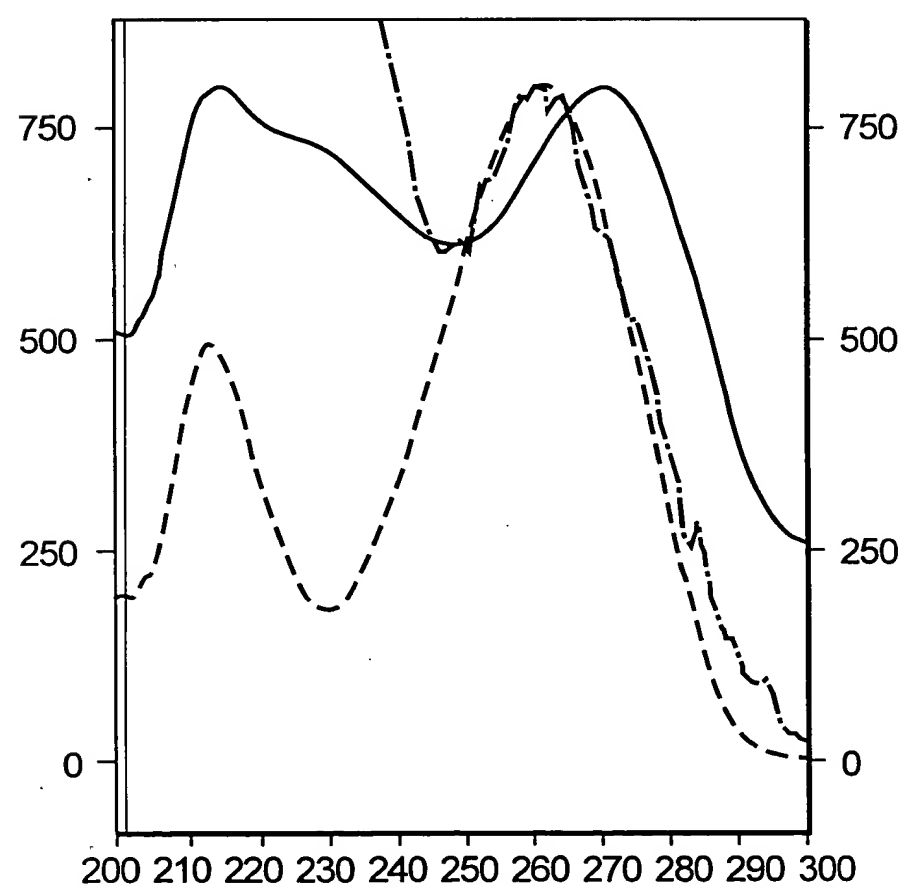


FIG. 20D

APPROVED	FIG
BY	CLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
 Application No.: 08/957,709
 Filed: October 24, 1997
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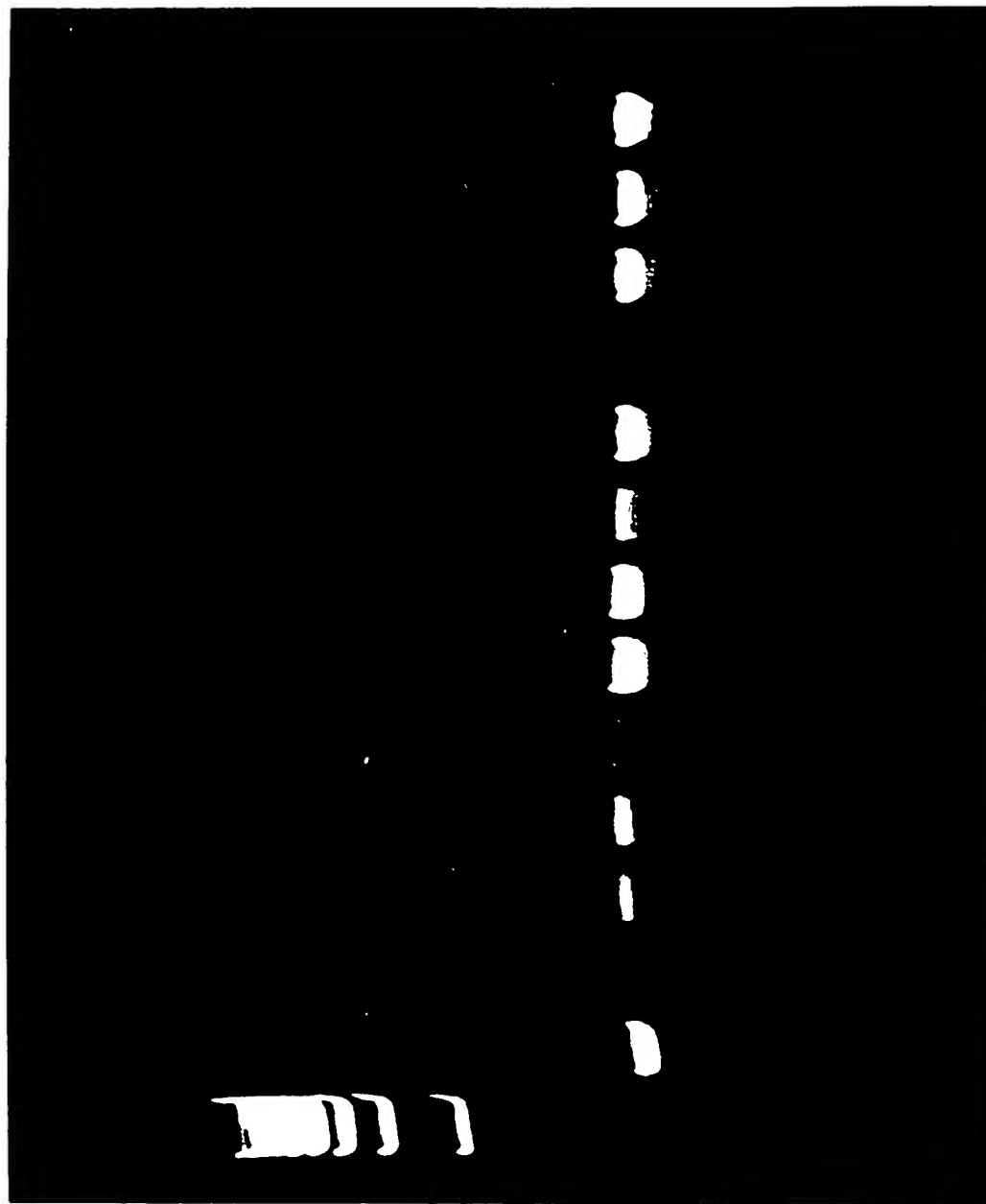


FIG. 21

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DATE	FISMAN	



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
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Pfu Pol			Taq Pol
NO	Pmole CONTROL OLIGO	Pmole dU OLIGO	Pmole dU OLIGO
PEF	16 8 1.6 0.8 0.16 M 0.08	0.016 16 8 1.6 0.8 0.16 0.08	0.16 16 8 1.6 0.8 0.08
-			
+			

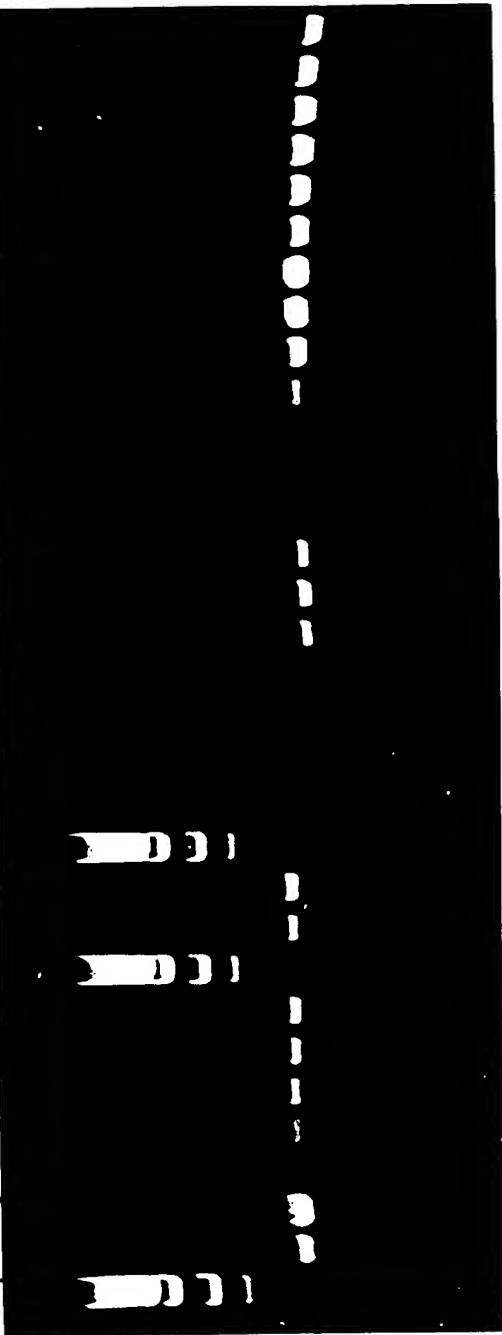


FIG. 22

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
QUARTSMAN		



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
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1 Kb	NEGATIVE	BLANK	HdUTPase	HdUTPase
LADDER	} POSITIVE }		UNDILUTED	1/10

5kb →

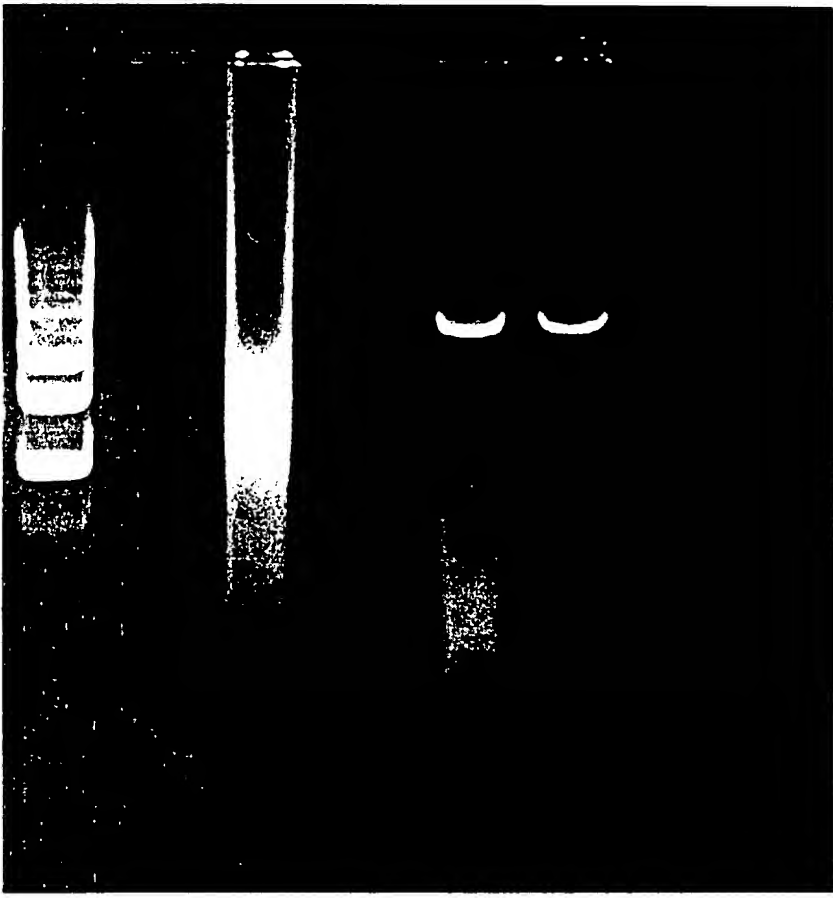
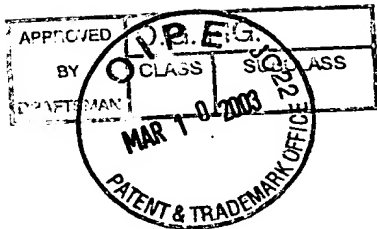


FIG. 23



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
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Filed: October 24, 1997
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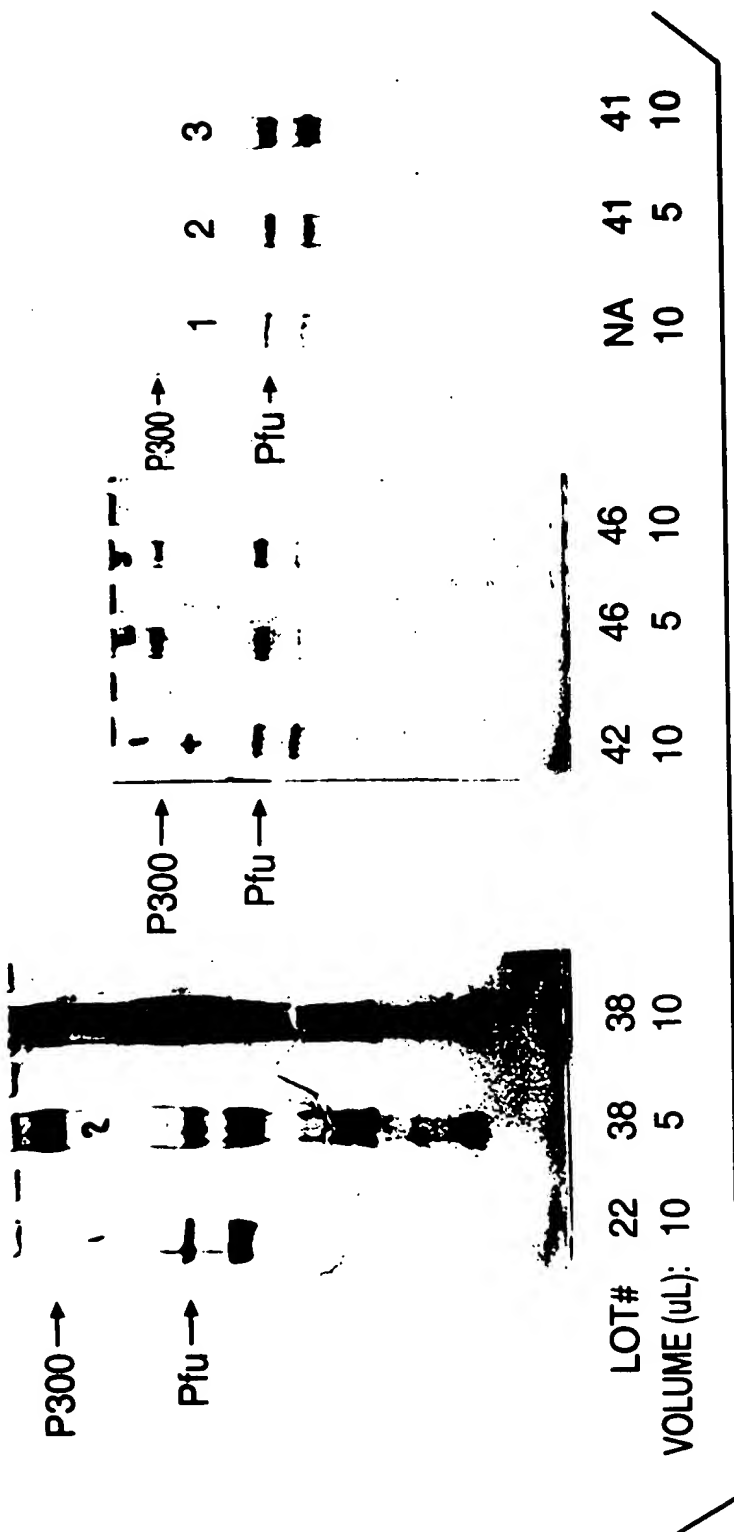


FIG. 24

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING S
 Inventors: Holly H. HOGREFE et al.
 Application No.: 08/957,709
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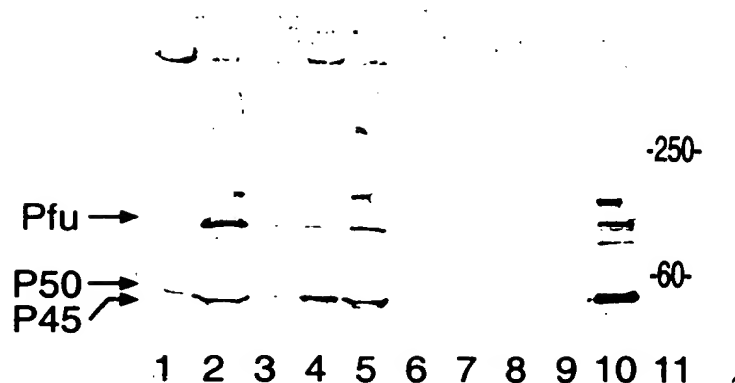


FIG. 25

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING
Inventors: Holly H. HOGREFE et al.
Application No.: 08/957,709
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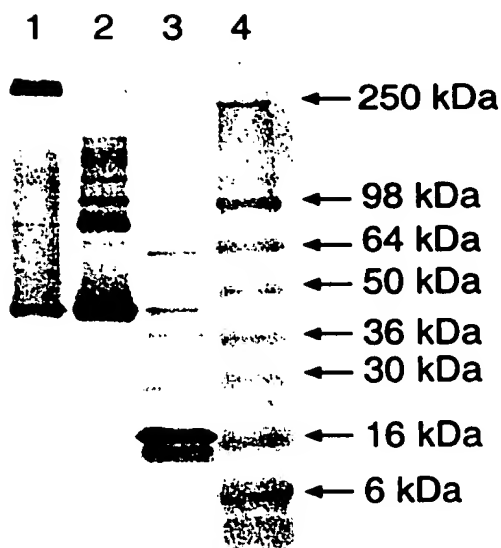


FIG. 26

APPROVED	O.O. FIG.	
BY	CLASS	SUBCLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
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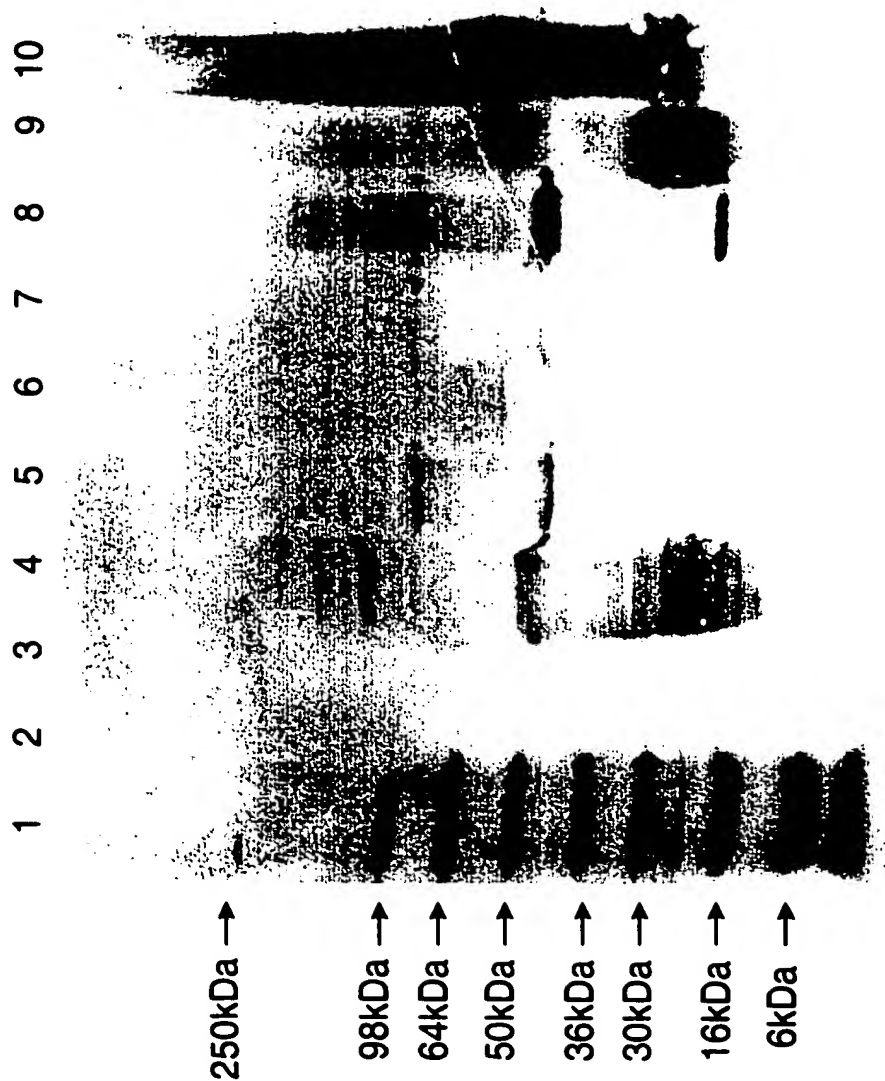


FIG. 27

APPROVED	2003	
BY	CLASS	SK CLASS
CHARTS		

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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SA
Inventors: Holly H. HOGREFE et al.
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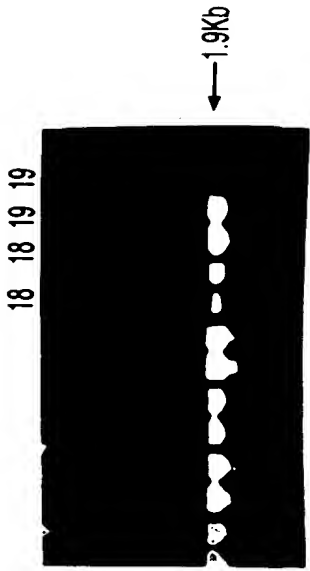
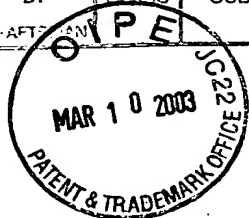


FIG. 28

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DATE		



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
 Application No.: 08/957,709
 Filed: October 24, 1997
 Attorney Docket No.: 04121.0116-01000
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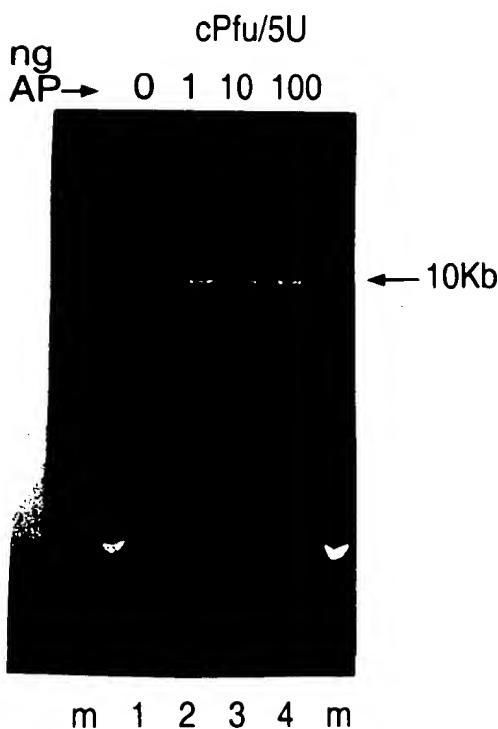


FIG. 29

BY	CLASS	SUBCLASS
ARTS/MAN		



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
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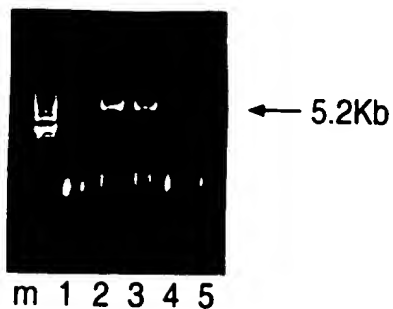


FIG. 30

BY CLASS SUBCLASS



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
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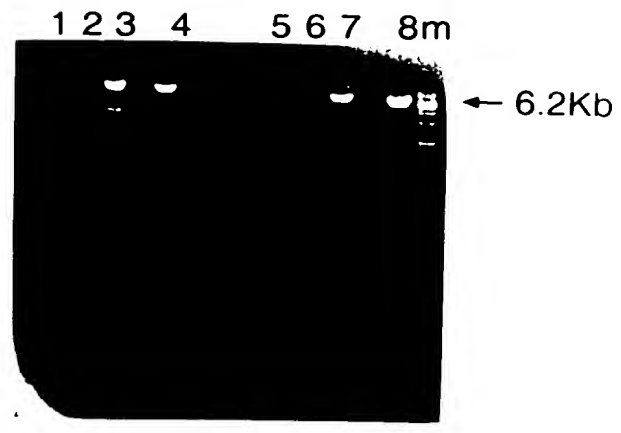
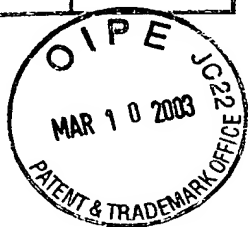


FIG. 31

APPROVED	D.G. H.G.	
BY	CLASS	SUBCLASS
DRAFTSMAN		



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
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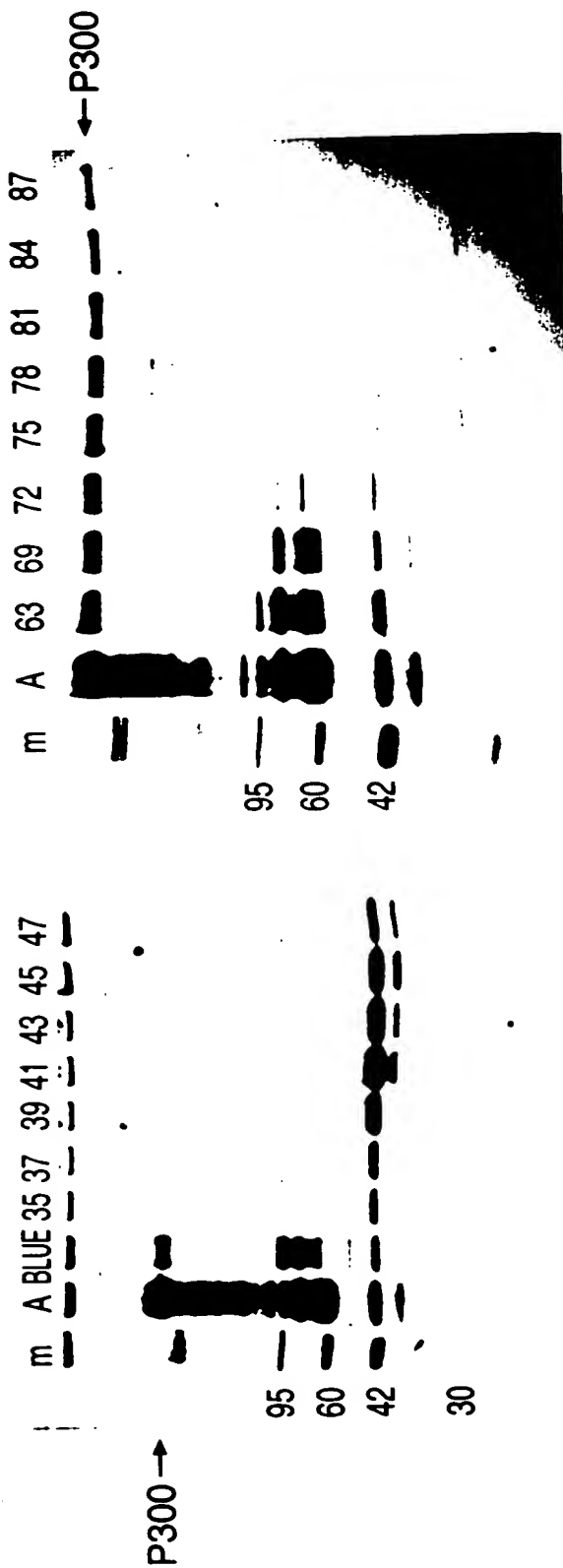
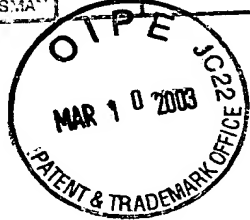


FIG. 32A

FIG. 32B

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
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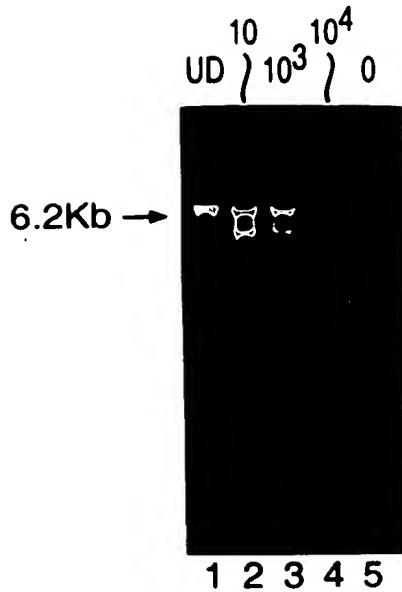
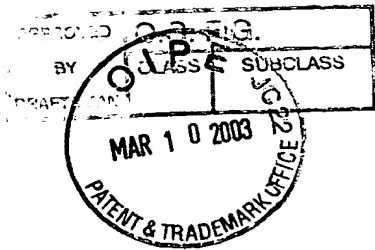


FIG. 33



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
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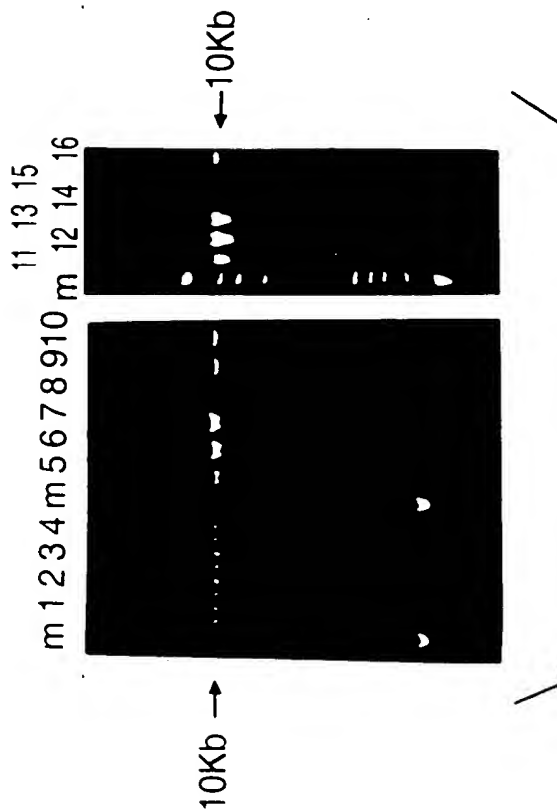


FIG. 34

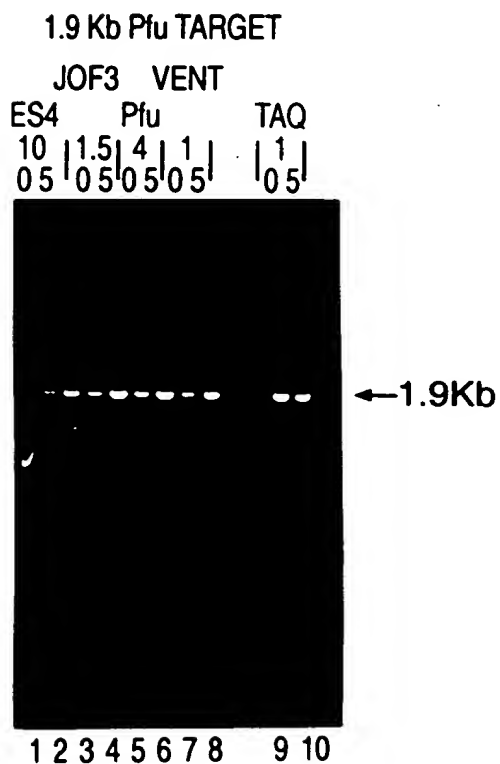
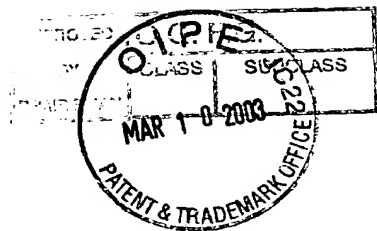
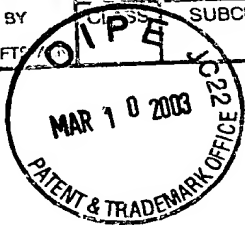


FIG. 35

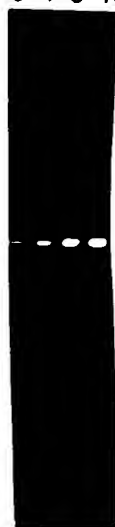
APPROVED	O.G. FIG.
BY	CLASS SUBCLASS
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DEEP VENT USING 0.75u

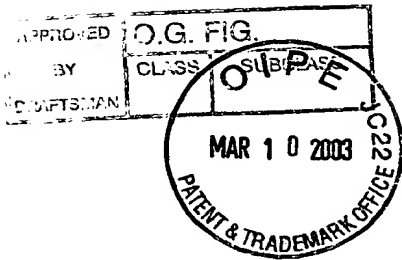
0 1 5 10



← 2Kb

1 2 3 4

FIG. 36

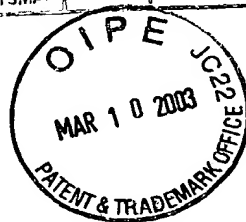


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Inventors: Holly H. HOGREFE et al.
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FIG. 37

APPROVED	U.S. G. FIG.	
BY	CLASS	SUBCLASS
PATENT & TRADEMARK OFFICE		



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
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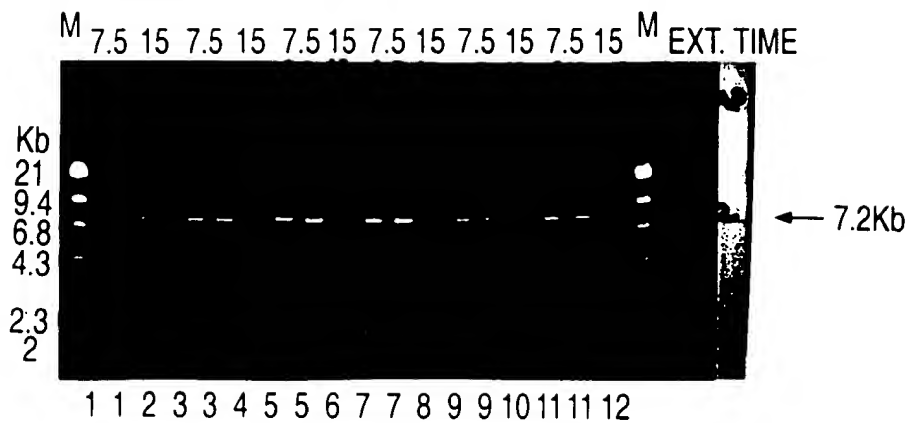
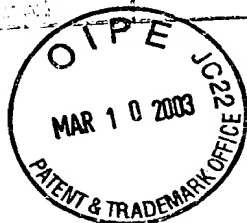


FIG. 38



Pfu "PCR ENHANCER" IN QUICKCHANGE MUTAGENESIS

LINEAR AMPLIFICATION CONDITIONS				TRANSFORMATION RESULTS	
POL.	BUFFER	H.S. #75	AMPL. PROD.	#cfu	%MUTANTS
nPfu (#38)	nPfu	0	+	84	95
		1 μ 1	\pm	47	87
		.1 μ 1	+	154	97
		.01 μ 1	++	632	95
		.001 μ 1	+	484	94
nPfu (#24A)	nPfu	0	+	94	89
		1 μ 1	+	34	85
		.1 μ 1	+	173	91
		.01 μ 1	++	468	96
		.001 μ 1	+	230	90

FIG. 39

APPROVED	O.C. FIG.	
BY	CLASS	SUBCLASS
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Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
 Inventors: Holly H. HOGREFE et al.
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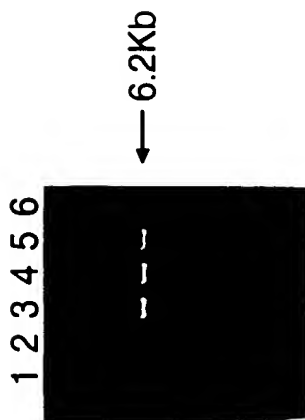
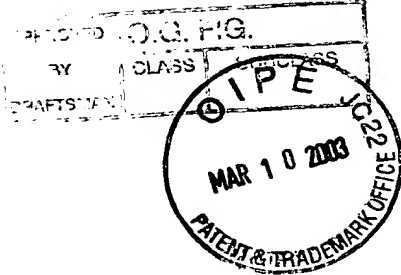


FIG. 40



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
Inventors: Holly H. HOGREFE et al.
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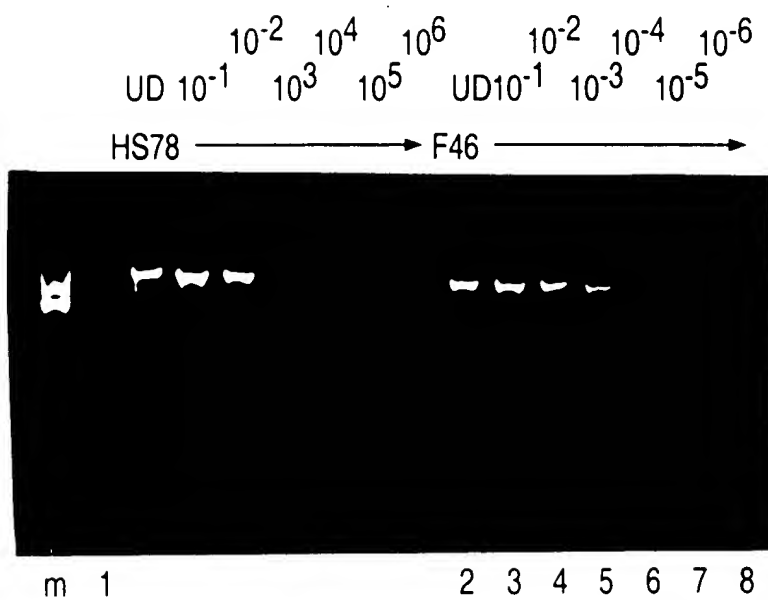
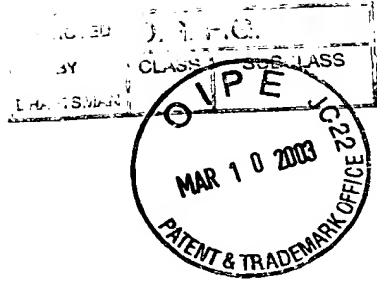


FIG. 41



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS,
PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND
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Inventors: Holly H. HOGREFE et al.
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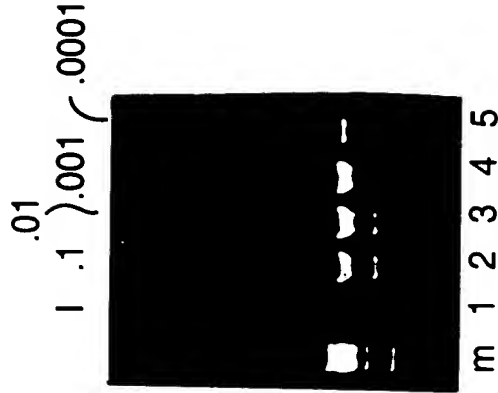


FIG. 42

APPROVED	O B FIG.	
BY	CLASS	SUBCLASS
DATE		

Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS, PEF PROTEIN COMPLEXES, ISOLATED PEF PROTEIN, AND METHODS FOR PURIFYING AND IDENTIFYING SAME
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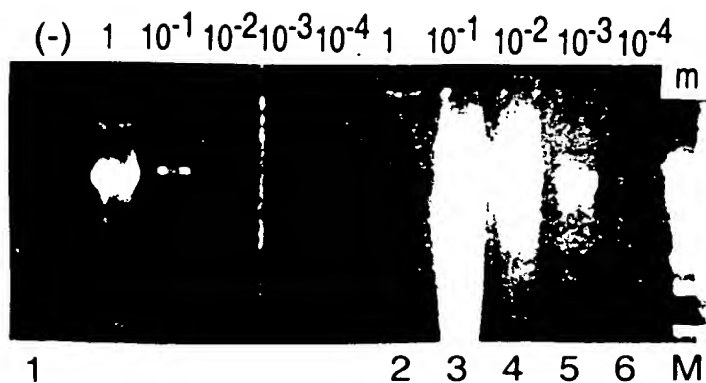
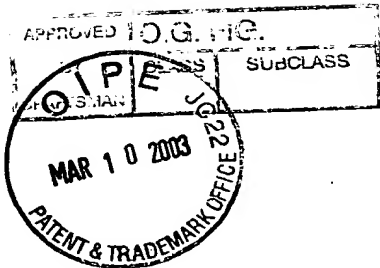


FIG. 43



Title: POLYMERASE ENHANCING FACTOR (PEF) EXTRACTS,
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FIG. 44B



FIG. 44A